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MULTIMODAL ANALYSIS OF DISCOURSE MARKERS 'DONC', 'ALORS' AND 'EN FAIT' IN CONVERSATIONAL FRENCH

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ABSTRACT

This paper, which is based on a multimodal corpus of conversational French, aims at describing some prosodic and gestural characteristics of the three discourse markers 'donc' ('so'), 'alors' ('so' or 'then') and 'en fait' ('in fact'). The pragmatic functions of 'donc' and 'alors' have been deeply analyzed in a few studies (Mosegaard-Hansen [9], Vlemings [12] and Zénone [13] and [14]) but none of them described the phonetic characteristics of the markers. The present paper also proposes the association of 'en fait' with 'donc' and 'alors' since it is met in similar contexts in discourse.

Keywords: Discourse markers, spoken French, prosody, gesture.

1. INTRODUCTION

In the field of pragmatics, Mosegaard-Hansen [9], Vlemings [12] and Zénone [13] and [14], among others, have described the functions of French discourse markers (DMs. *For a definition of Discourse Marker, see [6] and [10]*) 'donc' ('so') and/or 'alors' ('so' or 'then') in context. English DM 'so' has also been the object of some works by Bolden [3] and [4], and in some respect Local [7]. Looking at the data, we decided to add 'en fait' ('in fact') to the analysis since the DM is met in very similar contexts, although the three markers do not have the same meaning and can be considered as having a prototypical function.

Apart from Local's study [7] which served as a methodological framework for the present paper, none of the other studies presented above described any phonetic characteristic of the DMs.

To make up for this lack of description, some prosodic and gestural characteristics of the DMs will be presented according to 5 of their possible functions in discourse (presented in section 2) which are productive enough to allow statistical treatment of the data. This paper is part of a larger study which could not be published in its whole here for lack of space.

2. PRAGMATIC FUNCTIONS OF DMs

Three of the functions that are described in the pragmatics literature mentioned in the introduction are the following:

- **Conclusion (Concl):** the topic is coming to an end. A function described by Local [7] for 'stand-alone so', except that in French the marker is most of the time followed by 'euh' ('uh') in this function that may be assumed by either 'donc' or 'alors' to a lesser degree.

  Ex: ça fait référence à un truc (0.790[1]) *donc* euh (2.64) ['it refers to something *so uh*']

- **Inference (Inf):** what is said can be inferred from preceding discourse. A function that may be assumed by the 3 DMs.

  Ex: y avait une espèce d'écran géant, *donc* un matériel d'enfer ['there was a sort of huge screen *so* (it was) incredible equipment']

- **Resumption (Res):** marker used to resume the topic after an interruption or a parenthesis. A function that may be assumed by the 3 DMs.

  Ex: et donc je cherchais c'était dans les urgences vasculaires et tout ça (1.04) et *donc* je voyais des panneaux qui m'indiquaient un truc ['and so I was looking for, I was in the Emergency Stroke Services and stuff, and *so* I could see something on signboards']

In our own pragmatic analysis of the corpus, we thought that two other functions should be added:

- **Auto-correction (AC):** the speaker changes a word he/she has just mentioned or starts anew after abandoning a previous syntactic construction. A function that may be assumed by the 3 DMs.

  Ex: et ils sont là relativement souvent parce qu'ils ont un *en fait* c'est une pépinière ['and they are here quite often since they have a *in fact* it's a tree nursery']

- **Punctuation (P):** used at the end of a *Turn Contructional Unit* (TCU: an utterance that is complete from the syntactic, prosodic and semantic point of view) as a punctuation mark, much as

French DM 'quoi'. This function is mostly always assumed by 'en fait'.

Ex: y a que des tout petits patelins où y a rien quoi *en fait*, où y a un bistrot qui fait tout ['there are only very small villages without a single shop really *in fact*, with only one pub where you can buy everything']

As mentioned in the introduction, the markers do not have exactly the same meaning although they may be used with similar functions in discourse. Briefly put, the core meaning of 'donc' is one of consequence, whereas 'alors' is a temporal marker and 'en fait' introduces some unexpected discourse item (or a discourse item presented as such by the speaker) and may be understood as 'contrary to expectation'. The meaning of the markers may however be modified by the presence of other adjacent DMs in clusters, but also by the use of the marker in different contexts, so that they become more or less multifunctional: 'alors' is the most multifunctional DM, whereas 'en fait' is the least multifunctional of the three markers, 'donc' being intermediary. This has an impact on the phonetic realization of the DMs and on the presence of hand gestures.

In terms of pronunciation, we found that the most multifunctional markers show a much wider range of pronunciations. For instance, 'donc' is pronounced on a continuum ranging from total absence of nasalization (and plosive elision) to a spreading of nasalization over the two plosives (and insertion of epenthetic [ŋ] in between the nasal vowel and the final plosive which may undergo a voicing assimilation too). On the contrary, 'en fait', the least multifunctional marker, is pronounced with less variety.

We also noticed that the presence of co-verbal hand gestures is much higher with a marker like 'alors' than it is with 'en fait', and we believe that this is also due to the multifunctionality of DM 'alors'.

3. CORPUS AND ANNOTATIONS

This paper is based on a three-hour multimodal corpus of non-elicited conversational French between 6 speakers (CID Corpus described in [1]) [2]. The dialogues were transcribed and annotations were made in prosody using Praat [2] and in gesture using Elan [5]. These annotations are described in Table 1 below. Once again, many other parameters could have been taken into account for this study which does not mean to be exhaustive. Prosodic parameters were based on perception, including degree of stress. Primary stress falls on a syllable that is fully pronounced and is realized with a marked peak in intensity and/or F0, whereas secondary stress falls on a syllable that is fully pronounced but not uttered with any marked peak in intensity and F0. No stress has been assigned to a syllable that is reduced phonemically and doesn't have any marked F0/intensity peak. The Intonational Phrase (IP) can be described as a superior prosodic constituent (Selkirk [11]), with an F0 contour that does not show any break, and which includes a major prosodic prominence called "nuclear stress".

Table 1: Prosodic and gestural annotations.

Prosody	Gesture
Degree of stress (0, 1, 2)	Presence of co-verbal gestures[3]
F0 contour (Flat, Falling, Rising) on the whole DM	Gesture onset
Pitch range (high, mid, low)	Head movements
Voice quality	Gaze
Pause (before, after)	
Position of DM in IP	
Position of DM in TCU	
Marker duration	

The corpus yielded a total number of 718 occurrences of the 3 DMs, among which there were 124 'alors', 248 'en fait' and 346 'donc'. And the number of occurrences were the following in each of the 5 functions under study here:

Table 2: Number of DMs for each pragmatic function.

Function	Donc	Alors	En fait	Total
Conc	58	2	0	60
AC	18	12	21	51
P	1	0	74	75
Inf	115	46	3	164
Res	141	21	27	189
TOTAL	333	81	125	**539**

4. RESULTS

For each function assumed by the markers, two types of statistics were done on the data to draw out its main characteristics: a proportion and an Anova test.

4.1. Auto-correction

When the DMs have a function of auto-correction, they have the following prosodic characteristics:

- They carry a primary stress (Prop.Test: X-squared = 11.2, df = 1, p-value < 0.01),

- Their F0 contour is rising (Prop.Test: X-squared = 7.6, df = 1, p-value < 0.01),
- They come in initial position in the IP (Prop.Test: X-squared = 9.1, df = 1, p-value < 0.01), and in medial position in the TCU (Prop.Test: X-squared = 22.9, df = 1, p-value < 0.01),
- When the DM is 'en fait', it is shorter than its average duration (One-way F-Test: X-squared = 1.5, df = 31, p-value < 0.05).

The gestural characteristics of the DMs are:

- Hand gestures (when present) are initiated during the production of the DM (Prop.Test: X-squared = 6.3, df = 1, p-value < 0.05).

4.2. Inference

When the DMs have a function of inference, they have the following prosodic characteristics:

- They either carry a secondary stress (Prop.Test: X-squared = 4.8, df = 1, p-value < 0.05) or are unstressed (Prop.Test, X-squared = 4.9, df = 1, p-value < 0.05),
- Their F0 contour is flat (Prop.Test: X-squared = 17.5, df = 1, p-value < 0.01),
- They come in initial position in the IP (Prop.Test: X-squared = 37.1, df = 1, p-value < 0.01) but not necessarily in the TCU.

The gestural characteristics of the DMs are:

- Gaze is turned towards the other participant (Prop.Test: X-squared = 13.7, df = 1, p-value < 0.01),
- They are accompanied with 'emblems' (as defined by McNeill [8]) – speakers count the two parts of the inference on their fingers – showing that two discourse units are linked to each other (Prop.Test: X-squared = 4.6, df = 1, p-value < 0.05).

4.3. Topic resumption

When the DMs have a function of topic resumption, they have the following prosodic characteristics:

- They come in medial position in the IP (Prop.Test: X-squared = 4.4, df = 1, p-value < 0.05) but not necessarily in the TCU. This is due to the fact that many DMs playing this function are preceded and followed by other DMs like 'et' ('and') or 'euh' ('uh'),
- The DMs that aren't preceded by another DM are preceded by a silent pause (Prop.Test: X-squared = 17.6, df = 1, p-value < 0.01),
- When the DM is 'alors', it is shorter in duration than the average duration for this marker (One-way F-Test: X-squared = 1.2, df = 20, p-Value < 0.01).

The gestural characteristics of the DMs are:

- Gaze is turned away from the other participant (Prop.Test: X-squared = 15.4, df = 1, p-value < 0.01) therefore hindering the other participant from taking the turn.

4.4. Conclusion

When the DMs have a function of conclusion, they have the following prosodic characteristics:

- They have a flat F0 contour (Prop.Test: X-squared = 17.4, df = 1, p-value < 0.01),
- They are uttered in the lower range of the speaker's pitch (Prop.Test: X-squared = 28.8, df = 1, p-value < 0.01),
- They come in initial position in the IP (Prop.Test: X-squared = 25.1125, df = 1, p-value = 5.408e-07) and in the TCU (Prop.Test: X-squared = 39.8, df = 1, p-value < 0.01),
- They are preceded by a silent pause (Prop.Test: X-squared = 11.7, df = 1, p-value < 0.01) although there isn't necessarily a pause after them (typically because they are immediately followed by the filled pause 'euh'),
- They are uttered with either a creaky (Prop.Test: X-squared = 7.2, df = 1, p-value < 0.01) or a quiet voice (Prop.Test: X-squared = 7.4, df = 1, p-value < 0.01),
- They are longer than their average duration (One-way F-Test: X-squared = 1.3, df = 57, p-value < 0.01).

The gestural characteristics of the DMs are:

- Hand gestures (when present) do not have their onset during the production of the DMs (Prop.Test: X-squared = 5.8, df = 1, p-value < 0.05),
- They are typically accompanied with adaptors (self-touching / grooming gestures) (Prop.Test: X-squared = 11.6, df = 1, p-value < 0.01). What is relevant here is that adaptors are not co-verbal gestures and are massively produced when the participant is listening to the interlocutor. Therefore, the co-occurrence of adaptors and

markers playing a function of conclusion is congruent.

4.5. Punctuation

When the DMs have a function of punctuation, they have the following prosodic characteristics:

- They carry a secondary stress (Prop.Test: X-squared = 11.1, df = 1, p-value < 0.01),
- They are uttered in the lower range of the speaker's pitch (Prop.test: X-squared = 4.6, df = 1, p-value < 0.05),
- They come in final position in the IP (Prop.Test: X-squared = 86.7, df = 1, p-value < 0.01) and in the TCU (Prop.Test: X-squared = 161.1, df = 1, p-value < 0.01),
- They are uttered with a partial devoicing (Prop.Test: X-squared = 13.2, df = 1, p-value < 0.01) or a quiet voice (Prop.Test: X-squared = 9.9, df = 1, p-value < 0.01),
- They are followed by a silent pause (Prop.Test: X-squared = 35.8, df = 1, p-value < 0.01) although there is no pause before them (Prop.Test: X-squared = 26.1, df = 1, p-value < 0.01).

The gestural characteristics of the DMs are:

- Gaze is turned towards the other participant, thus indicating that he/she can take the turn at this point (Prop.Test: X-squared = 6.5, df = 1, p-value < 0.05),
- Hand gestures (when present) are not initiated during the utterance of the DM (Prop.Test: X-squared = 6.8, df = 1, p-value < 0.01).

5. CONCLUSION

The three French discourse markers 'donc', 'alors' and 'en fait' have been examined in this paper in a multimodal perspective which offers a complement to existing studies in pragmatics.

We have seen that five functions that the DMs assume in discourse can be distinguished thanks to the degree of stress of the DM, its pitch range and contour, length and voice quality, but also thanks to the position of the DM in the Intonation Phrase and the Turn Constructional Unit.

At the level of gestures, we note that although head movements were annotated, no regularity could be observed that would lead to statistically significant results. Functions are rather distinguished thanks to gaze direction (away from other participant in the case of topic resumption and towards participant in the case of inference and punctuation) and mostly hand gesture onset (a gesture is not initiated during a marker that has a function of conclusion or punctuation). Gesture type is relevant only for the inference and conclusion functions (DMs produced together with emblems and adaptors).

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[1] Silent pause in seconds.

[2] Supported by the French National Research Agency (Project number: ANR BLAN08-2_349062), the OTIM project is referenced on the following webpage: http://aune.lpl.univ-aix.fr/~otim/.

[3] Gestures were annotated according to McNeill [8]; their typology and the annotation process have been fully described in Bertrand et al. [1].